# The effect of dietary valine-to-lysine of lactating sows on milk composition and piglet gain

Hansen, Anja Varmløse; Bruun, T.S.; Hansen, Christian Fink

*Publication date:*
2014

*Document version*
Early version, also known as pre-print

**The ratio between energy and lysine is essential to improve milk yield in sows**

*C. Flummer[1], T. Feyera[1], U. Krogh[1], T. Hinrichsen[2], T.S. Bruun[3] and P.K. Theil[1]*
*[1]Aarhus University, Blichers Allé 20, 8830 Tjele, Denmark, [2]DLG, Vesterbrogade 4 A, 1620 København V, Denmark, [3]Danish Pig Research Center, Axeltorv 3, 1609 Copenhagen, Denmark; christine.flummer@agrsci.dk*

Nutrients supplied through the feed and body mobilization are important for milk production in sows. However, it is unknown whether mobilization of body fat or body protein is most beneficial for achieving a high milk yield. The present study was conducted to study how mobilization of body protein and fat affects sow milk yield. Twelve sows were fed 70% of calculated energy requirements and supplied with either 70% (LL) or 86% (HL) of calculated lysine requirements. Both groups were designed to mobilize from body tissues; the HL mainly from fat depots and the LL from both fat and muscle. Sows were fed a basal diet and a lactation supplement, targeting the nutrient requirements for sow maintenance and milk production, respectively. On average, the daily feed intake was 6.13 and 5.49 kg/d, and supplied 798 and 807 g/d of SID crude protein, and 47 and 52 g/d of SID lysine, for the LL and HL group, respectively. The HL group lost numerically more backfat (3.7 mm) than LL sows (2.0 mm), although it was not significantly different (P=0.26). The LL sows weaned 13.2 pigs per litter, had higher milk production throughout lactation, and an average daily milk production of 13.0 kg, compared to 11.6 kg milk/d (P=0.01) in the HL group (12.2 weaned pigs per litter). Sow body weight loss from day 2 to 28 of lactation was similar (32 kg in both groups). All LL and HL sows returned to estrus within 5 days after weaning. The current results demonstrated that body mobilization is important for the milk yield. Furthermore, data indicate that sows are not able to compensate for insufficient energy supply. Milk yield seems to depend on an optimal ratio between fat and protein mobilization, which can be achieved by selecting the right lysine to energy ratio.



**The effect of dietary valine-to-lysine ratio of lactating sows on milk composition and piglet gain**

*A.V. Hansen[1], T.S. Bruun[2] and C.F. Hansen[1]*
*[1]University of Copenhagen, Grønnegaardsvej 2, 1870 Frederiksberg, Denmark, Denmark, [2]Danish Pig Research Centre, Danish Agriculture & Food Council, Axeltorv 3, 1609 Copenhagen, Denmark; avha@sund.ku.dk*

The aim of this study was to determine the effect of dietary valine-to-lysine ratios (Val:Lys) during lactation on milk composition and litter growth rate of high producing lactating sows. Sixty 2$^{end}$ parity sows were allotted to one of six dietary treatments varying in standard ileal digestible Val:Lys (76, 79, 82, 85, 91, and 97%) from day 2 postpartum. The sows were fed semi *ad libitum* 2 times per day until day 10 and from day 10 three times per day. Litters were equalized at day 2 to 14 piglets and weaned at day 28. A milk sample was obtained on day 17-18. The litters were weighed at equalization and at weaning and the average daily gain (ADG, kg/day) was calculated. The litter was removed from the sow 45 min before milk sampling and after 45 min an intramuscular injection with 2 ml oxytocin was given. Milk was sampled from 3-5 glands. The milk was analyzed for dry matter (DM), protein, fat, lactose and urea (MilkoScan FT2). Data was analyzed in R using a linear model testing the effect of dietary treatment and block. Pearson's correlations were calculated to test for correlations between response variables. Preliminary results on milk composition were available for 14 sows. There was no effect of block (P>0.05). There was no effect of dietary Val:Lys on milk composition (P>0.05). Dry matter content was correlated with lactose (r=0.79, P<0.05) and fat (r=0.77, P<0.05) percentage. Sows fed the diet with lowest Val:Lys (76%) had the highest fat (9.2%) and DM (26.2%) content of the milk and sows fed the diet with the highest Val:Lys (97%) had the lowest fat (7.4%) and DM (22.0%) content in milk. The highest ADG of piglets (3.49 kg/d) was seen in the lowest Val:Lys (76%) and the lowest ADG was in the second highest Val:Lys group (91%). In conclusion, the preliminary results of the study shows no effects of dietary Val:Lys ratio on milk composition and ADG of the piglets.

# Book of Abstracts of the 65th Annual Meeting of the European Federation of Animal Science




**Book of abstracts No. 20 (2014)**
**Copenhagen, Denmark**
**25 - 29 August 2014**